

CLAIMS

1. An air conditioning system for an aircraft in which cabin air is recirculated and mixed with cold air from an air conditioning machine which includes at least an expansion turbine over which warm pressurised air is expanded and cooled, and wherein the system includes a heat exchanger in which a heat load from hot cabin air is exchanged with the warm pressurised air prior to the pressurised air being expanded by the expansion turbine.
2. An air conditioning system for an aircraft in which cabin air is recirculated and mixed with cold air from an air conditioning machine which includes at least an expansion turbine over which warm pressurised air is expanded and cooled, and wherein the system includes a heat exchanger in which a heat load from a hot avionics system is exchanged with the warm pressurised air prior to the pressurised air being expanded by the expansion turbine.
3. An air conditioning system for an aircraft in which cabin air is recirculated and mixed with cold air from an air conditioning machine which includes at least an expansion turbine over which warm pressurised air is expanded and cooled, and wherein the system includes a heat exchanger in which in a first mode of operation a heat load from hot cabin air is exchanged with the warm pressurised air prior to the pressurised air being expanded by the expansion turbine, and in a second mode of operation a heat load from a hot avionics system is exchanged with the warm pressurised air prior to the pressurised air being expanded by the expansion turbine.

4. A method of operating an air conditioning system in an aircraft of the kind in which cabin air is recirculated and mixed with cold air from an air conditioning machine which includes at least an expansion turbine over which warm pressurised air is expanded and cooled, and wherein the system includes a heat exchanger in which a heat load is exchanged with the warm pressurised air prior to the pressurised air being expanded by the expansion turbine, the method including providing a heat load being hot cabin air to the heat exchanger.

5. A method of operating an air conditioning system in an aircraft of the kind in which cabin air is recirculated and mixed with cold air from an air conditioning machine which includes at least an expansion turbine over which warm pressurised air is expanded and cooled, and wherein the system includes a heat exchanger in which a heat load is exchanged with the warm pressurised air prior to the pressurised air being expanded by the expansion turbine, the method including providing a heat load from a hot avionics system to the heat exchanger.

6. A method of operating an air conditioning system in an aircraft of the kind in which cabin air is recirculated and mixed with cold air from an air conditioning machine which includes at least an expansion turbine over which warm pressurised air is expanded and cooled, and wherein the system includes a heat exchanger in which a heat load is exchanged with the warm pressurised air prior to the pressurised air being expanded by the expansion turbine, the method including in a first mode of operation, providing a heat load being hot cabin air to the heat exchanger, and in a second mode of operation providing a heat load from a hot avionics system to the heat exchanger.

7. A method according to claim 6 wherein the first mode of operation of the method is performed when the cabin air is hotter than a predetermined temperature range, and the second mode of operation of the method is performed when the cabin air is at or below the predetermined temperature range.

8. A method according to claim 6 or claim 7 wherein the first and second modes of operation of the method are performed concurrently during a transition phase as the cabin air temperature is above the predetermined temperature range and the avionics system is hotter than another predetermined temperature range.

9. An air conditioning system for an aircraft in which there is an air conditioning machine for supplying cold air to a cooling circuit which includes a heat load from a hot avionics system, the air conditioning machine including at least an expansion turbine over which warm pressurised air is expanded and cooled, and wherein the cooling circuit includes a heat exchanger in which heat from the heat load is exchanged with the warm pressurised air prior to the pressurised air being expanded by the expansion turbine.

10. An air conditioning system according to claim 9 which includes an unpressurised aircraft cabin, air from the cooling circuit after warming the warm pressurised air in the heat exchanger, being vented from the cooling circuit.

11. A method of operating an air conditioning system for an aircraft substantially as hereinbefore described with reference to the accompanying drawing.

12. An air conditioning system for an aircraft substantially as hereinbefore described with reference to and as shown in the accompanying drawing.

13. Any novel feature or novel combination of features described herein and/or in the accompanying drawings.